



# RATIONAL NUMBERS

## LESSON 8

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Connect

Definition:

Numbers which can be expressed in the form  $\frac{a}{b}$  where a and b are integers and b is not equal to 0 are called rational numbers

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## Connect

## RATIONAL NUMBERS

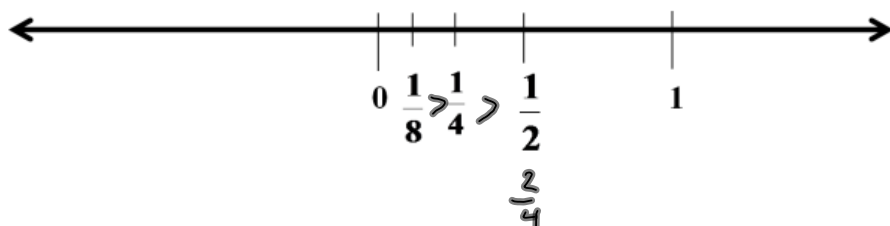
Rational numbers may appear in different forms but all of them can be written as a fraction in the form  $\frac{a}{b}$

Rational Number	$-2$	$4\frac{1}{5}$	$0.9$	$0.6\overline{6}$
Form $\frac{a}{b}$	$-\frac{2}{1}$	$\frac{21}{5}$	$\frac{9}{10}$	$\frac{2}{3}$

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## Connect

## Comparing Numbers - Number Lines



The number line can be used to compare numbers with exactly one of the following being true:

$$a < b$$

$a$  would be to the left of  $b$ .

$$a = b$$

They are at the same position and have the same value.

$$a > b$$

$a$  is to the right of  $b$ .

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**Connect****Comparing Numbers - Same Denominator**

A fraction consists of two numbers separated by a line.

The top number ( or **NUMERATOR**) tells how many fractional pieces there are. In the fraction  $\frac{3}{8}$ , we have three pieces.

The **DENOMINATOR** of a fraction tells how many pieces an object was divided into. The fraction  $\frac{3}{8}$  tells us that the whole object was divided into 8 pieces.

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**Connect****Comparing Numbers - Same Denominator**

If the denominator of two fractions are the **same**, the fraction with the **largest numerator** is the **larger fraction**.

Example:



because all of the pieces are the same and five pieces are more than three pieces.

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**Practice****YOU TRY!**

Find which fraction is greater

$$\frac{5}{12} \text{ or } \frac{8}{12}$$

$$\frac{8}{12}$$

$$\frac{4}{7} \text{ or } \frac{2}{7}$$

$$\frac{4}{7}$$

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**Connect****Comparing Numbers - Different Denominator**

If the numerators of two fractions are the **same**, the fraction with the **smallest denominator** is the **larger fraction**.



Example:

$\frac{5}{8}$  is larger than  $\frac{5}{16}$

**because each fraction says there are five pieces. If an object is divided into 8 pieces, each piece will be larger than if the object were split into 16 pieces.**

**Therefore** five larger pieces are more than five smaller pieces.

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## Practice

## YOU TRY!

Find which fraction is greater

$$\frac{4}{15} \text{ or } \frac{4}{12}$$

$$\frac{4}{12}$$

$$\frac{6}{7} \text{ or } \frac{6}{8}$$

$$\frac{6}{7}$$

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## Connect

## Comparing Numbers - Cross Product

$$\frac{3}{4} \quad \frac{5}{6} \quad \frac{18}{24} < \frac{20}{24}$$

For any rational numbers  $\frac{a}{b}$  and  $\frac{c}{d}$ , with  $b > 0$  and  $d > 0$ :

1.  $\rightarrow$  if  $\frac{a}{b} < \frac{c}{d}$ , then  $ad$   $< bc$ , and

2. if  $ad < bc$ , then  $\frac{a}{b} < \frac{c}{d}$ .

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## Connect

## Comparing Numbers - Cross Product

Example:

$$\frac{3}{8} \text{ and } \frac{2}{5}$$

$$\underline{3} \times 5 = 15 \quad | \quad 2 \times \underline{8} = 16$$

Since  $15 < 16$ , then:

$$\frac{3}{8} \text{ is less than } \frac{2}{5}$$

Steps:

1) Multiply the numerator on the left by the denominator on the right.

2) Multiply the numerator on the right by the denominator on the left.

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## Practice

YOU TRY!

Find which fraction is greater

$$\frac{3}{9} \text{ or } \frac{5}{8}$$

$$3 \times 8 = 24$$

$$1 \times 5 = 5$$

$$\frac{3}{9} < \frac{5}{8}$$

$$\frac{4}{7} \text{ or } \frac{7}{10}$$

$$40 < 49$$

$$\frac{4}{7} < \frac{7}{10}$$

$$\frac{40}{70} < \frac{49}{70}$$

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## Connect

## Comparing Numbers - Decimal Method

Just **convert** each fraction to decimals, and then compare the decimals.

Example: Which is bigger?  $3 \div 8$  or  $5 \div 12$   
 $\frac{3}{8}$  or  $\frac{5}{12}$

You need to convert each fraction to a decimal first. Use your calculator and divided the numerator by the demoninator.

$$0.375 < 0.41\bar{6}$$

$$\frac{3}{8} < \frac{5}{12}$$

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## Practice

## YOU TRY!

Find which fraction is greater

$$\frac{4}{9} \text{ or } \frac{5}{8}$$

$$32 < 45$$

$$\frac{4}{9} < \frac{5}{8}$$

$$0.\bar{4} < 0.625$$

$$\frac{6}{7} \text{ or } \frac{9}{10}$$

$$60 < 63$$

$$\frac{6}{7} < \frac{9}{10}$$

$$0.857 < 0.9$$

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1. Make sure you are checking your homework solutions

[www.leohayeshigh.nbed.nb.ca](http://www.leohayeshigh.nbed.nb.ca)

2. Complete Lesson 8 worksheet